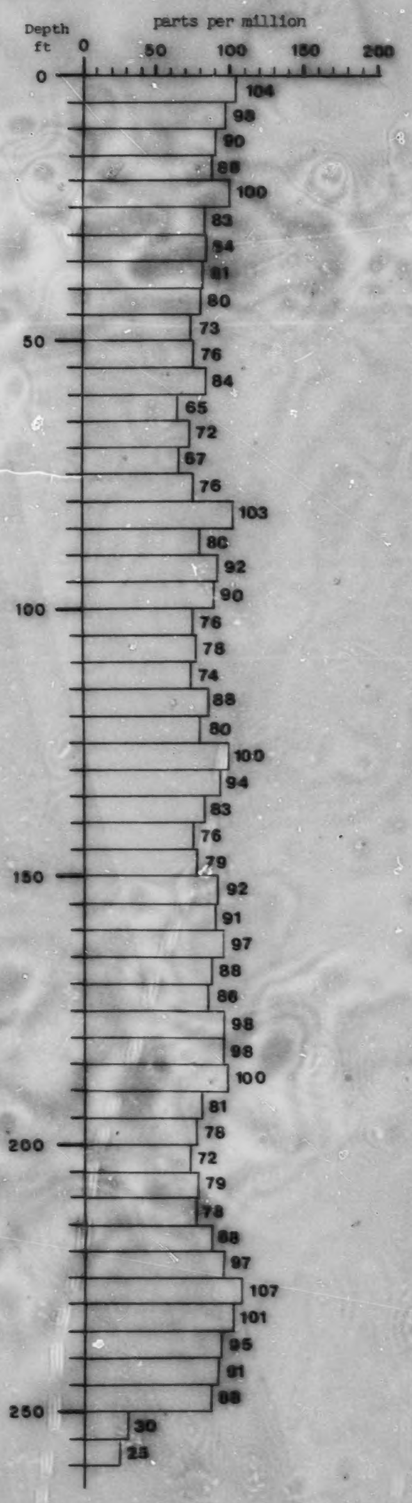
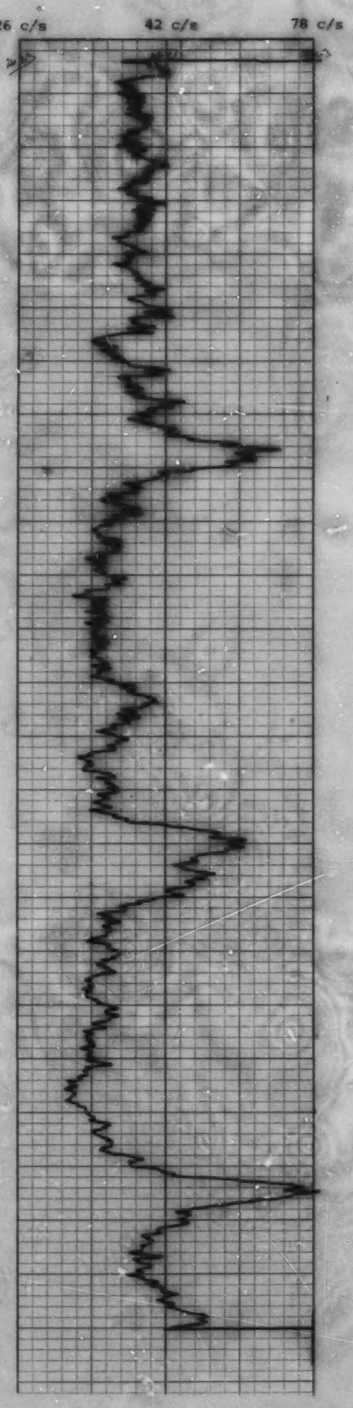
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT 80-873

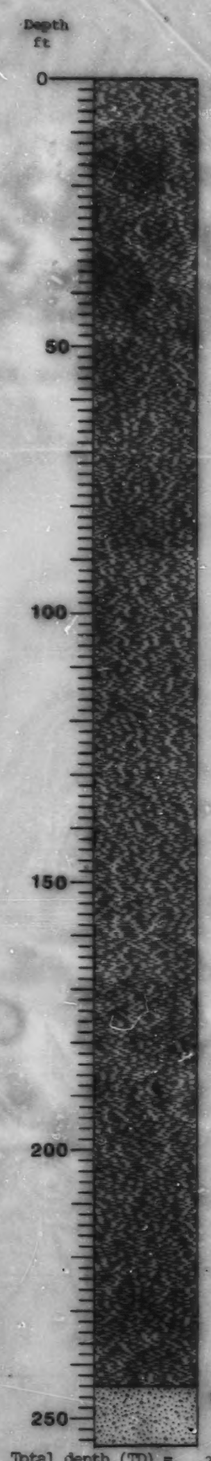
LITHIUM LOG
( J. D. Vine, 1978, written commun.)




GAMMA - RAY LOG
[c/s]




COLUMNAR SECTION




Total depth (TD) = 255 ft

CONVERSION FACTORS

| Multiply English unit | By | To obtain metric units |
|---|---|---|
| Inches (in.) | 2.540 | Centimeters (cm) |
| Feet (ft) | 0.305 | Meters (m) |

This report has not been edited for conformity with U.S. Geological Survey editorial standards

LITHOLOGIC LOG

| Depth (feet) | DESCRIPTION |
|---|---|
| 0- 4 | Clay, variegated, pale-olive (10Y 6/2 dry), and moderate-yellowish-brown (10YR 5/4 dry), calcareous |
| 4- 10 | Clay, pale-olive (10Y 6/2 dry), calcareous |
| 10- 15 | Clay, variegated, pale-olive (10Y 6/2) and moderate-yellowish-brown (10YR 5/4), calcareous |
| 15- 20 | Clay, pale-olive (10Y 6/2), calcareous |
| 20- 35 | Clay, variegated, pale-olive (10Y 6/2) and moderate-yellowish-brown (10YR 5/4), calcareous |
| 35- 40 | Clay, dusky-yellow (5Y 6/4), calcareous |
| 40- 45 | Clay, variegated, pale-olive (10Y 6/2) and moderate-yellowish-brown (10YR 5/4), calcareous |
| 45- 51 | Clay, pale-olive (10Y 6/2), calcareous |
| 51- 65 | Clay, dark-yellowish-brown (10YR 4/2), calcareous |
| 65- 70 | Clay, variegated, pale-olive (10Y 6/2) and moderate-yellowish-brown (10YR 5/4), calcareous |
| 70- 74 | Clay, grayish-yellow-green (5GY 7/2), calcareous |
| 74- 76 | Clay, grayish-black (N2), calcareous |
| 76- 81 | Clay, dark-greenish-gray (5G 4/1), calcareous |
| 81- 89 | Clay, variegated, pale-olive (10Y 6/2) and moderate-yellowish-brown (10YR 5/4), calcareous. Unit predominantly (90 percent) pale-olive in color |
| 89-103 | Clay, variegated. Lithology similar to 81-89 ft, but moderate-yellowish-brown (10YR 5/4) now predominant (90 percent) |
| 103-110 | Clay, greenish-gray (5GY 6/1), calcareous |
| 110-118 | Clay, variegated, pale-olive (10Y 6/2) and moderate-yellowish-brown (10YR 5/4), calcareous. Unit is 95 percent pale-olive and 5 percent moderate-yellowish-brown |
| 118-121 | Clay, variegated. Lithology similar to 110-118 ft, except unit is 60 percent moderate-yellowish-brown and 40 percent pale-olive |
| 121-125 | Clay, grayish-green (5G 5/2), calcareous |
| 125-130 | Clay, pale-olive (10Y 6/2), calcareous |
| 130-135 | Clay, light-olive-gray (5Y 5/2), calcareous |
| 135-140 | Clay, dark-yellowish-brown (10YR 4/2), calcareous |
| 140-144 | Clay, light-olive-gray (5Y 5/2), calcareous |
| 144-157 | Clay, medium-bluish-gray (5B 5/2), calcareous |
| 157-160 | Clay, variegated, dark-greenish-gray (5G 4/1) and medium-bluish-gray (5B 5/1), calcareous. Unit predominantly (90 percent) dark-greenish-gray |
| 160-171 | Clay, moderate-yellowish-brown (10YR 5/4), calcareous |
| 171-175 | Clay, grayish-yellow-green (5GY 7/2), calcareous |
| 175-195 | Clay, moderate-yellowish-brown (10YR 5/4), calcareous |
| 195-200 | Clay, dark-yellowish-brown (10YR 4/2), calcareous |
| 200-203 | Clay, pale-olive (10Y 6/2), calcareous |
| 203-220 | Clay, dark-greenish-gray (5G 4/1), calcareous |
| 220-225 | Clay, greenish-gray (5G 6/1), calcareous |
| 225-244 | Clay, dark-greenish-gray (5GY 4/1), calcareous |
| 244-255 | Sand, fine to coarse, with granules and pebbles in a light-olive-gray (5Y 5/2) calcareous silt matrix. Pebbles, as much as 30 mm across, are very-dark-red (5R 2/6) andesite. Unit composed of 80 percent sand, 5 percent granules, 5 percent pebbles, and 10 percent silt matrix. Below 250 ft the unit contains occasional cobbles as much as 76 mm across |

## INTRODUCTION

### DISCUSSION

The Federal Land Policy and Management Act of 1976 (Public Law 94-579) directed the Secretary of the Interior to prepare and implement by September 1980 a comprehensive long-range plan for the management, use, development, and protection of public lands within the California Desert Conservation Area (CDCA). The responsibility to prepare this plan was assigned to the Bureau of Land Management's (BLM) California Desert Planning Staff. The BLM was directed to evaluate mineral as well as botanical, wildlife, cultural, and recreation resource data for effective multiple-use land planning. In turn, the BLM requested assistance from the U.S. Geological Survey (USGS) in defining the mineral resources.

In 1978 the USGS drilled 56 shallow test wells to depths of 50-600 ft to provide BLM with the requested mineral resource data. The lithologic and geophysical data obtained from one of these test wells drilled on Coyote Dry Lake, Calif., are presented in this report.

### LOCATION AND DRILLING METHODS

Test well CO-2 was drilled in NE¼SW¼ sec. 35, T. 11 N., R. 2 E., SBM, California (lat. 35°02'42" N., long. 116°44'58" W.) on Coyote Dry Lake (see index map). This test well was completed in June 1978 to a total depth of 255 ft by a contracted, truck mounted, reverse circulation drill rig. Drilling fluids, a mixture of air and water, were pumped down the outer annulus of dual-wall drill pipe to an open face insert bit. Drilling fluids mixed with sediment cuttings were forced up the inner annulus of the drill pipe to the surface where samples were collected. This drilling technique ensured recovery of uncontaminated sediment samples because the return cuttings were not in contact with the bore wall. In situ ground water was used as a drilling fluid where possible; otherwise, a fine mist of imported freshwater and air was used.

A continuous lithologic log was completed during drilling. Sediment samples were collected at 5-ft intervals and were described in the field. Field lithologic descriptions were supplemented by microscopic study when the samples were returned to the laboratory. Sediment names used in this report are those defined by Folk (1968). The rock-color chart (Goddard and others, 1948) was used to color classify damp to wet samples. Lithologic percentages are approximate.

Drill cuttings were analyzed for lithium (Li) by the USGS, in Denver, Colo. Lithium analyses are included in this report to complete the mineral resource appraisal on Coyote Dry Lake.

### GEOPHYSICAL LOG

A gamma-ray logging survey was run from the surface to a drilled depth of 240 feet. The log was run through the drill string because the playa sediments would have squeezed in or collapsed and sealed the test well before conventional open-hole logs could have been run in the well. Before the log can be interpreted, corrections must be made for the effect of the drill pipe. The necessary data for the correction, described on Schlumberger Chart FGR-8, are listed below. The corrected log will approximate the natural radioactivity, but quantitative measurement is not possible, inasmuch as the sonde was not calibrated.

| | |
|---|---|
| Test well diameter: 4.5 in. | Total thickness of dual-wall drill pipe: 0.63 in. |
| Drill string inner diameter: 2.47 in. | Sonde outer diameter: 1.25 in. |
| Outer diameter: 4.5 in. | Logging speed: 17 ft/min |


### ACKNOWLEDGMENTS

G. Thomas Sarver supplemented field lithologic descriptions by laboratory study of sediment cuttings under binocular microscope. J. D. Cathcart, U.S. Geological Survey, Denver, Colo., ran the geophysical log.


### REFERENCES

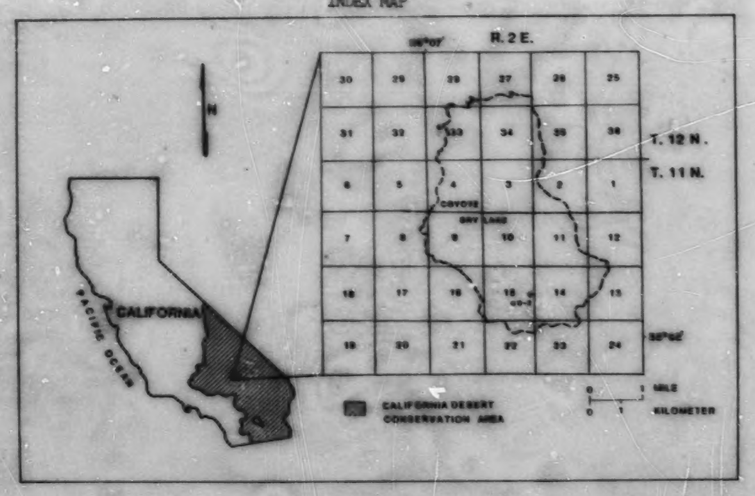

Folk, R. L., 1968, Petrology of sedimentary rocks: Austin, University of Texas, 170 p.

Goddard, E. N., chm., and others, 1948, Rock-color chart: National Research Council; reprinted by Geological Society of America, 1951, 1963, 1970, 6 p.


### NOTE

Data from test well CO-1, NE¼SW¼ sec. 16, T. 11 N., R. 2 E., SBM, are published in Open-File Report 80-1094.

INDEX MAP




# GEOPHYSICAL AND LITHOLOGIC DATA FROM TEST WELL CO-2, COYOTE DRY LAKE, SAN BERNARDINO COUNTY, CALIFORNIA


By

Roger D. Dockter


1980


best copy available